



National Standards Authority of Ireland

IRISH STANDARD

I.S. EN 14046:2003

ICS 13.030.99;

**PACKAGING - EVALUATION OF THE
ULTIMATE AEROBIC BIODEGRADABILITY
AND DISINTEGRATION OF PACKAGING
MATERIALS UNDER CONTROLLED
COMPOSTING CONDITIONS - METHOD BY
ANALYSIS OF RELEASED CARBON
DIOXIDE**

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EUROPEAN STANDARD
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English version

**Packaging - Evaluation of the ultimate aerobic biodegradability
and disintegration of packaging materials under controlled
composting conditions - Method by analysis of released carbon
dioxide**

Emballage - Evaluation de la biodégradabilité aérobie
ultime et de la désintégration des matériaux d'emballage
dans des conditions contrôlées de compostage - Méthode
par analyse du dioxyde de carbone libéré

Verpackung - Bestimmung der vollständigen aeroben
biologischen Abbaubarkeit und Desintegration von
Packstoffen unter kontrollierten Kompostierbedingungen -
Verfahren mittels Analyse des freigesetzten
Kohlenstoffdioxids

This European Standard was approved by CEN on 27 December 2002.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and United Kingdom.



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Foreword

This document (EN 14046:2003) has been prepared by Technical Committee CEN/TC 261 "Packaging", the secretariat of which is held by AFNOR.

[This European Standard](#) shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2003, and conflicting national standards shall be withdrawn at the latest by September 2003.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association.

This document contains annexes A, B, C, D and E, which are informative.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovak Republic, Spain, Sweden, Switzerland and the United Kingdom.

EN 14046:2003 (E)

1 Scope

This European Standard specifies a method for the evaluation of the ultimate aerobic biodegradability of packaging materials based on organic compounds under controlled composting conditions by measurement of released carbon dioxide at the end of the test. This method is designed to resemble typical aerobic composting conditions for the organic fraction of mixed municipal solid waste. The packaging material is exposed in a laboratory test to an inoculum which is derived from compost. The aerobic composting takes place in an environment where especially temperature, aeration and humidity are closely monitored and controlled. The test method is designed to yield a percentage and rate of conversion of carbon of the test material to released carbon dioxide.

The conditions described in this European Standard do not necessarily always correspond to the optimal conditions allowing the maximum degree of biodegradation to occur.

2 Normative references

Not applicable.

3 Terms and definitions

For the purposes of this European Standard, the following terms and definitions apply.

3.1 test material

packaging materials made from organic compounds normally tested in compact forms at a suitable size

3.2 ultimate biodegradation of a test material

level of biodegradation achieved when the test material is utilised by micro-organisms resulting in the production of carbon dioxide, water, mineral salts and new microbial cellular constituents (biomass)

3.3 total dry solids

amount of solids obtained by taking a known amount of test material or compost and drying at about 105 °C to constant weight

3.4 volatile solids

amount of solids obtained by subtracting the residues of a known amount of test material or compost after incineration at about 550 °C from the total dry solids content of the same sample. The volatile solids content is an indication of the amount of organic matter

3.5 theoretical amount of formed carbon dioxide ($ThCO_2$)

theoretical maximum amount of carbon dioxide formed after oxidising a chemical compound completely, calculated from the molecular formula; expressed in this case as mg carbon dioxide per mg or g test compound

3.6 lag-phase

time from the start of a test until adaptation and/or selection of the degrading micro-organisms are achieved and the biodegradation degree of a chemical compound or organic matter has increased to about 10 % of the maximum level of biodegradation, recorded in days

3.7 maximum level of biodegradation

maximum biodegradation degree of a chemical compound or organic matter in a test, recorded in per cent, above which no further biodegradation takes place during the test

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